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# SCIENCE :

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## TO OUR ENGLISH READERS.

We have received from Messrs. Deacon & Co., of 150 Leadenhall street, London, England, a standing order for a large supply of "SCIENCE," which will be forwarded weekly. We shall be obliged if our English readers will make this fact known to their friends.

## ILLUSIONS.\*

In reality this work might have been styled an essay on error, for the author deals, in his clear and masterly way, with other errors of the human judgment than those which are termed illusions in the narrower sense of that term. His essay loses nothing, and gains much by thus occupying a much broader field than the one, furnished by the sensory illusion, would constitute *per se*. Perhaps the most unfortunate part of the work, is the opening passage: "Common sense, knowing nothing of fine distinctions, is wont to draw a sharp line between the region of illusion and that of sane intelligence. To be the victim of an illusion is, in the popular judgment, to be excluded from the category of rational men. The term at once calls up images of stunted figures with ill-developed brains, half-witted creatures, hardly distinguishable from the admittedly insane. . . . The nineteenth century intelligence plumes itself on having got at the bottom of mediæval visions and church miracles, and it is wont to commiserate the feeble minds that are still subject to these self-deceptions."

We say this passage is an unfortunate one, and this particularly because of its position in the opening chapter of a book which, as we must particularly emphasize, is throughout one of the clearest and most readable psychological treatises that we have found in

the English language; this passage on the other hand, is as full of wrong assumptions, misconstructions, and errors as a single paragraph can well be. The popular mind fails to condemn the bearer of an illusion, as it does the bearer of a delusion; the mediæval visions were not, even in popular parlance illusions, but hallucinations, and indeed the popular sense in which the term illusion is used, that is, the one employed by poets and classical writers, is anything but a reflection on the bearer of the illusion. The day-dream, the poetic illusion, and the constructions of a sanguine temperament, are the objects associated in the lay-mind with that term.

On the fourth page is further evidence that the author has failed to discriminate practically between delusions, hallucinations, and illusions. After stating that alienists have good reason to limit the word illusion to illusory perceptions, he adds "such illusions of the senses are the most palpable and striking evidences of mental disease." Inasmuch as illusions are common with the sane, it is incorrect to lay greater stress on the not very frequent illusions of the insane, than on the marked and characteristic hallucinations and the still more universal delusions of that class.

The author defines an illusion as a species of error which counterfeits the form of immediate, self-evident, or intuitive knowledge whether as a sense perception or otherwise. Further on he discriminates between the illusion and the fallacy, by characterising the former as a falsification of primary or intuitive knowledge, and the latter as a falsification of secondary or inferential knowledge. It must be admitted that the author is happier in his discrimination than in his definition, and an illustration of the difficulty under which definers labor recurs in the peroration of the same chapter, where he says that the illusion is seen to arise through "some exceptional feature in the situation or condition of the individual, which, for the time, breaks the chain of intellectual solidarity which under ordinary circumstances binds the single member to the collective body." The greater portion of this passage would constitute an excellent nucleus for a definition of insanity, but at the same time it seems to us that it fails to cover those common illusions, which involve the visual apparatus, and of which familiar illustrations are furnished in most physiological text books. The dividing line between the delusion, the hallucination, and the illusion, should have been strictly drawn at the outset, by our author. We have offered the following as showing the difference between the hallucination and the illusion: While a hallucination is a subjective perception of an object as a real presence, without a real presence to justify the perception, and a memory is the subjective per-

\* *Illusions, a psychological study.* By JAMES SULLY. New York, D. Appleton and Co.—Volume XXXIII. of the International Scientific Series.

ception of an object not actually present, involving the recognition of its absence, an illusion is the subjective perception of an object actually present, but in characters which the object does not really possess. With appropriate alterations these definitions will cover the abstract hallucination and phantastic illusion of Wundt as well.

In his second chapter, the author ably, but we believe unsuccessfully, endeavors to defend his refusal to recognize the distinction between illusion and hallucination as the leading principle of classification, though he admits the necessity of making this distinction in accordance with the leading alienists. Wundt, an authority whose teachings in psychological physiology the author of the present volume has most successfully assimilated, has drawn attention to the numerous connecting links existing between illusions and hallucinations, and yet strongly insists on utilizing their general differences as a basis of classification. We find the chief drawback to the otherwise great value of the work, in its failure to give adequate space to the anatomical mechanism concerned in false registrations of the perceptive and conceptional sphere. If it be borne in mind that while even hallucinations may be based on actual impressions, the latter are not the determining factor of the hallucination, the difficulty in discriminating between these perversions is overcome; this is illustrated by the occasional persistence of dream-images in the waking state, and the moving of certain hallucinated images consonant with the movements of the eye-ball. If an actual or subjective impression, say in the shape of *chromatopsia* and *tinnitus*, be granted to exist in a subject hallucinating the vision and voice of the Virgin Mary, it will be instantly recognized by every observant alienist, that the real determining factor is here centrifugal, while in the illusion, which constructs, out of a ball rolling in an ill-lighted apartment, a mouse, the determining factor takes a centripetal course. In the former instance, the misinterpretation lies ready made in the Cortex, and seizes on the slight external pretext, whose existence we only admit for the sake of the argument, to incorporate it, in its substance; in the latter, it is based upon an imperfect registration and a gradual constructive interpreting process. Nothing could more forcibly illustrate the correctness of these propositions than the very case cited from Wundt by Mr. Sully of a forester who saw the real objects of the outer world, (furniture and tapestry, for example,) through the wood piles which formed the subjects of his hallucinations.

With these remarks on the propositions of the opening chapters, our criticism ceases to be adverse. In the last twelve chapters of the book, the author gives

a concise review of the chief theories held by alienists and metaphysicians on the perceptive illusion, the introspective illusion, dreams illusions of memory, and those of belief. We refrain from again pointing out places where the author encroaches on the fields of delusion and hallucination, as he has given a wider scope to his definition of the illusion, than we are inclined to consider proper. It is but just to say that he gives a just interpretation to the views of alienists, an interpretation which only occasionally manifests that tincture of uncertainty which is unavoidable on the part of one devoid of a practical knowledge of the insane.

The perusal of this work cannot fail to be profitable to the student of mental pathology as well as of metaphysics. More reliable in the latter field, than in the former, it is yet a successful attempt to present the modern German ideas on the subject, and to combine the teachings of the practical and the abstract psychologists. To the general reader we can only repeat, what we said at the outset, it is the clearest rendition of a difficult yet fascinating theme, to be found in our language.

E. C. SPITZKA, M. D.

#### ON THE DISCOVERIES OF THE PAST HALF-CENTURY RELATING TO ANIMAL MOTION.

By J. BURDON-SANDERSON, M.D., LL.D., F.R.S.

The two great branches of Biology with which we concern ourselves in this section, Animal Morphology and Physiology, are most intimately related to each other. This arises from their having one subject of study—the living animal organism. The difference between them lies in this, that whereas the studies of the anatomist lead him to fix his attention on the organism itself, to us physiologists it, and the organs of which it is made up, serve only as *vestigia*, by means of which we investigate the vital processes of which they are alike the causes and consequences.

To illustrate this I will first ask you to imagine for a moment that you have before you one of those melancholy remainders of what was once an animal—to wit, a rabbit—which one sees exposed in the shop of poulterers. We have no hesitation in recognising that remainder as being in a certain sense a rabbit; but it is a very miserable vestige of what was a few days ago enjoying life in some wood or warren, or more likely on the sand-hills near Ostend. We may call it a rabbit if we like, but it is only a remainder—not the thing itself.

The anatomical preparation which I have in imagination placed before you, although it has lost its inside and its outside, its integument and its viscera, still retains the parts for which the rest existed. The final cause of an animal, whether human or other, is muscular action, because it is by means of its muscles that it maintains its external relations. It is by our muscles exclusively that we act on each other. The articulate sounds by which I am addressing you are but the results of complicated combinations of muscular contractions—and so are the scarcely appreciable changes in your countenances by which I am able to judge how much, or how little, what I am saying interests you.

Consequently the main problems of physiology relate to muscular action, or as I have called it, animal motion. They may be divided into two—namely (1) in what does muscular action consist—that is, what is the process of